

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**



In re the Application of: **YABU, Takayuki, et al.**

Group Art Unit: **2828**

Serial No.: **09/648,632**

Examiner: **JACKSON, Cornelius H**

Filed: **August 28, 2000**

P.T.O. Confirmation No.: **5763**

For: **DISCHARGE ELECTRODES CONNECTING STRUCTURE FOR LASER
APPARATUS AND LASER APPARATUS THEREWITH**

SUBMISSION OF APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

December 1, 2003

Sir:

Submitted herewith are an original and two copies of an Appeal Brief in the above-identified U.S. patent application.

Attached please find a check in the amount of \$330.00 to cover the cost for the Appeal Brief.

If any additional fees are due in connection with this submission, please charge our Deposit Account No. 01-2340. This paper is filed in triplicate.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP

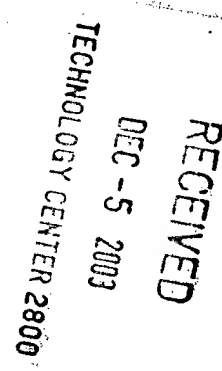
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PATENT TRADEMARK OFFICE





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF APPEALS

APPEAL BRIEF FOR THE APPELLANTS

Ex parte YABU, Takayuki et al.

DISCHARGE ELECTRODES CONNECTING STRUCTURE FOR LASER APPARATUS

AND LASER APPARATUS THEREWITH

Serial Number: 09/648,632

Filed: August 28, 2000

Group Art Unit: 2828

Examiner: Cornelius H. JACKSON

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Date: December 1, 2003
Atty. Docket No. 001092



**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re the Application of: **YABU, Takayuki, et al.**

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For: **DISCHARGE ELECTRODES CONNECTING STRUCTURE FOR LASER
APPARATUS AND LASER APPARATUS THEREWITH**

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

December 1, 2003

Sir:

This is an appeal from the Office Action dated June 16, 2003 (Paper No. 17) in which claims
1 and 2 were finally rejected.

A Notice of Appeal and a Petition for Extension of Time were timely filed on September 16,
2003.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the subject application, which is:

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Minato-ku
Tokyo 107-8414, JAPAN**

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II. RELATED APPEALS AND INTERFERENCES

Appellants know of no other appeals or interference proceedings related to the present appeal.

III. STATUS OF CLAIMS

Claims 1 and 2 on appeal have been finally rejected under 35 USC §103(a) as being unpatentable over JP 1-268078 A to Ikakura (hereinafter "**Ikakura**").

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. CLAIMS ON APPEAL

A clean copy of claims 1 and 2 on appeal is attached hereto as Exhibit A.

VI. SUMMARY OF THE INVENTION

The present invention generally relates to a discharge exciting laser apparatus, and more particular to a discharge electrodes connecting structure in a laser apparatus and a laser apparatus provided with the discharge electrodes.

One embodiment of the present invention is directed to a discharge electrodes connecting structure for a laser apparatus comprising:

a pair of anode 5A and cathode 5B provided within a laser chamber 2 for sealing a laser gas in an opposing manner, generating a discharge so as to excite a laser gas flowing therebetween and oscillating a laser beam;

a conductive anode base 6 holding the anode 5A;

an insulative cathode base 8 holding the cathode 5B; and

a return plate 9 electrically connecting the anode base to the laser chamber 2 so as to supply a current to the anode and having a thickness of equal to or more than 100 μm and equal to or less than 500 μm . (Specification, page 11, line 23 to page 13, line 14; Figs. 1-2 and 4-5)

Another embodiment of the present invention is directed to a laser apparatus comprising:

a laser chamber 2 sealing a laser gas;

discharge electrodes constituted by a pair of anode 5A and cathode 5B provided within the laser chamber in an opposing manner, generating a discharge so as to excite a laser gas flowing therebetween and oscillating a laser beam;

a conductive anode base 6 holding the anode 5A;

an insulative cathode base 8 holding the cathode 5B; and

a return plate 9 electrically connecting the anode base to the laser chamber 2 so as to supply a current to the anode 5A,

wherein a thickness of the return plate 9 is set to be equal to or more than 100 μm and equal to or less than 500 μm , and the return plate 9 is arranged substantially in parallel to a gas flow of the laser gas flowing between the discharge electrodes 5A, 5B. (Specification, page 9, line 23 to page 10, line 5)

VII. THE ISSUES

1. Whether the invention, as recited in Appellants' claims 1 and 2 on appeal, is unpatentable over **Itakura** under 35 USC §103(a).

VIII. GROUPING OF THE CLAIMS

Rejected claims 1 and 2 on appeal stand or fall together because the 35 USC §103(a) rejection of claims 1 and 2 on appeal discussed below is argued collectively for both claims.

IX. ARGUMENT WITH RESPECT TO THE ISSUES

A. THE REFERENCES

The Examiner has applied only one prior art reference to reject claims 1 and 2 under 35 USC §103(a), namely, **Itakura**, which is discussed on pages 1-3 of the specification and is admitted as “prior art” by Appellants.

Itakura, as shown in Figs. 6 and 7 of the instant application, discloses an excimer laser apparatus 101 provided with a laser chamber 102 for sealing a laser medium, such as a laser gas. An anode 105A and a cathode 105B are provided within a laser chamber for sealing a laser gas 102 in an opposing manner. A discharge is generated so as to excite a laser gas flowing therebetween and oscillating a laser beam. A conductive anode base 106 holds the anode, an insulative cathode base 108 holds the cathode, and a return page 109 electrically connects the anode base to the laser chamber so as to supply a current to the anode.

Itakura discloses the return plates arranged substantially in parallel to a gas flow of the laser gas flowing between the discharge electrodes.

B. SUMMARY OF EXAMINER'S REJECTIONS

Claims 1 and 2 on appeal stand finally rejected under 35 USC §103(a) as unpatentable over **Itakura**.

The Examiner urges that **Itakura** teaches a discharge electrode connecting structure for a laser apparatus Figs. 6-7 comprising a pair of anode 105A and cathode 105B provided within a laser chamber 102 for sealing a laser gas in an opposing manner, generating a discharge so as to excite a laser gas flowing therebetween and oscillating a laser beam; a conductive anode base 106 holding the anode; an insulative cathode base 108 holding the cathode; a return plate 109 electrically connecting the anode base to the laser chamber so as to supply a current to the anode, as stated in Applicant's specification, page 1, paragraph 3 through page 3, line 5; and a high voltage power source supplying a high frequency current between the anode and the cathode, as stated in Applicant's specification, page 2, lines 5-11. The Examiner admits that **Itakura** fails to teach the thickness form 100 to 500 μm for the anode base. As for the thickness of the return plate, the Examiner urges that it is well known that making the return plate too thin causes it to vibrate due to the gas flow, as stated in Applicant's specification, page 3, lines 14-17. The Examiner argues that it has been held that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 2, the Examiner urges that **Itakura** teaches the return plate is arranged substantially in parallel to a gas flow of the laser gas flowing between the discharge electrode, see specification, page 2, lines 20-26.

C. APPELLANTS' ARGUMENT

It is a basic tenet of patent law that to justify the use of a particular combination of prior art references to find a claim unpatentable, there must be a showing that the references themselves embody the specific claimed combination. This teaching was affirmed by the PTO U.S. Patent and Trademark Office Board of Patent Appeals and Interferences in *Ex parte Clapp*, 227 USPQ 972 (P.T.O. Bd. Pat. App. Int. 1985). This principle embodies the same concept propounded by the Court of Appeals for the Federal Circuit in that, not only must there be a teaching in the prior art of the structural elements of appellant's claimed invention, the prior art itself must actually suggest that the structural elements be combined in a similar manner as the claimed invention. See, e.g., *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985), **vacated on other grounds**, *Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 229 USPQ 478 (1986).

As stated in claims 1 and 2 on appeal, the structure and apparatus described therein include:

a high voltage power source supplying a high frequency current between the anode and the cathode;

wherein said high frequency current includes frequencies which are more than 1 MHz, and said return plate is thicker than *double* an entering depth of the high frequency current and restrainable from vibrating the return plate due to the laser gas flow [*emphasis added*].

Itakura does not teach or suggest these features (except for the return plate's double thickness feature). The Examiner urges that Appellants' specification, on page 2, lines 5-11, explains that **Itakura** teaches a high voltage power source supplying a high frequency current between the anode and the cathode. However, the cited description only states that a high voltage power source supplies a current, the description does not indicate the frequency of the current. Therefore, the **Itakura** teaching cited above does not support the rejection.

Additionally, the cited description of **Itakura** fails to disclose the return plate being thicker than the entering depth of the high frequency current. Appellants do not understand why the 35 USC §103(a) rejection was maintained after this feature was added to the claims.

Appellants' representative discussed this issue in the March 13, 2003 personal interview. The Examiner elaborated that a particular claimed thickness of the return plate would not make the claims non-obvious. The rationale seemed¹ to be that one skilled in the art was familiar with the skin-depth effect and would make a conducting element as thick as necessary to provide as much cross-sectional area as the high frequency current would use. Therefore, a return plate would likely be thicker than double the skin depth.

Nonetheless, no such teaching of such a return plate is made of record. Appellants explain on page 11 of their specification that in operation high frequency current enters from both the front *and* back surfaces of the sheet-like return plate. Accordingly, Appellants' return plate is at least *double* the entering depth. Such a feature is not taught or suggested in **Itakura**.

¹Such explanation was not provided in the Examiner's Interview Summary, form PTO-413, and no Office Action includes this explanation.

The Examiner has specifically urged that:

This is an inherent property of the return plate since the current only travels along an outside region of the return plate and never touching in the central portion of the return plate.

It seems that the Examiner thinks that, with an alternating current (such as the claimed frequency, which can be greater than 1 MHz.), there will always be a central region in the return plate where the current will not flow.

Appellants respectfully disagree with the Examiner's assertion. It is respectfully submitted that the current will flow through the entire cross-section, even if the frequency is greater than 1 MHz, on condition that the return plate is equal to double an entering depth of the high frequency current. This is because the entering depth is determined on a basis of the frequency of the current and the electromagnetic property of the return plate, not the thickness of the return plate (see pages 10 to 11 of the specification).

Unless a prior art teaching or suggestion is provided to modify the **Itakura** return plate such that it would have the claimed thickness, or unless a citation to an appropriate principle in the MPEP or a court opinion is provided which describes why such a modification would have been obvious, appellants respectfully submit that the obviousness rejection of claims 1 and 2 on appeal under 35 USC §103(a) should be withdrawn.

X. CONCLUSION

For the above reasons, The Board of Patent Appeals and Interferences is therefore respectfully requested to reverse the Examiner's 35 USC §103(a) rejection of claims 1 and 2 on appeal and pass this application to issue.

In the event this paper is timely filed, Appellant hereby petitions for an appropriate extension of time. The fee for any such extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



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Enclosure: Appendix A containing Claims on Appeal

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For: **DISCHARGE ELECTRODES CONNECTING STRUCTURE FOR LASER APPARATUS AND LASER APPARATUS THEREWITH**

CLAIMS ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

December 1, 2003

Sir:

The claims on appeal are 1 and 2, presented below.

Claim 1 (currently amended): A discharge electrodes connecting structure for a laser apparatus comprising:

a pair of anode and cathode provided within a laser chamber for sealing a laser gas in an opposing manner, generating a discharge so as to excite a laser gas flowing therebetween and oscillating a laser beam;

a conductive anode base holding the anode;

an insulative cathode base holding the cathode;

a return plate electrically connecting the anode base to said laser chamber so as to supply a current to the anode and having a thickness of equal to or more than 100 μm and equal to or less than 500 μm ; and

a high voltage power source supplying a high frequency current between the anode and the cathode;

wherein said high frequency current includes frequencies which are more than 1 MHz, and said return plate is thicker than double an entering depth of the high frequency current and restrainable from vibrating the return plate due to the laser gas flow.

Claim 2 (currently amended): A laser apparatus comprising:

a laser chamber sealing a laser gas;

discharge electrodes constituted by a pair of anode and cathode provided within the laser chamber in an opposing manner, generating a discharge so as to excite a laser gas flowing therebetween and oscillating a laser beam;

a conductive anode base holding the anode;

an insulative cathode base holding the cathode;

a return plate electrically connecting the anode base to said laser chamber so as to supply a current to the anode; and

a high voltage power source supplying a high frequency current between the anode and the cathode;

wherein said high frequency current includes frequencies which are more than 1 MHz, and said return plate is thicker than double an entering depth of the high frequency current and restrainable from vibrating the return plate due to the laser gas flow;

U.S. Patent Application S.N. 09/648,632

wherein a thickness of the return plate is set to be equal to or more than $100\text{ }\mu\text{m}$ and equal to or less than $500\text{ }\mu\text{m}$, and the return plate is arranged substantially in parallel to the laser gas flow between said discharge electrodes.